STATE OF MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION





Madison Paper Industries Somerset County Madison, Maine A-427-77-5-A Departmental
Findings of Fact and Order
New Source Review
NSR #5

FINDINGS OF FACT

After review of the air emissions license amendment application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes Annotated (M.R.S.A.), Section 344 and Section 590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

FACILITY	Madison Paper Industries
LICENSE TYPE	06-096 CMR 115, Minor Modification
NAICS CODES	322121 Paper Mills
NATURE OF BUSINESS	Mechanical Pulp and Supercalendered Paper
	Production
FACILITY LOCATION	Madison, Maine

B. Amendment Description

Madison Paper Industries has submitted an amendment application to allow natural gas to be fired in Boiler 6, in addition to the current oil firing capacity.

Also included in this amendment is the change in emission limits for PM and PM_{10} for Boilers 4 and 7 when firing natural gas. Previous emission limits for the boilers were based on AP-42 values which the Department finds are not appropriate to be used as license limits. The new emission limits are based on the Department's BACT findings.

C. Emission Equipment

The following equipment is addressed in this air emission license:

Fuel Burning Equipment

2

Equipment	Maximum Capacity (MMBtu/hr)	Maximum <u>Firing Rate</u>	Fuel Type	Stack #
Boiler 4	119	793.3 gal/hr	No. 6 Fuel Oil, 2% S	1
124.8		122,353 scf/hr	Natural Gas	1
Boiler 6	99.6	664 gal/hr	No. 6 Fuel Oil, 2% S	1
Boller o	99.0	96,699 scf/hr	Natural Gas	1
Boiler 7	117	780.0 gal/hr	No. 6 Fuel Oil, 0.5% S	1
Bollet /	122.7	120,294 scf/hr	Natural Gas	1

When firing natural gas, Madison Paper Industries has requested that the input capacity of Boiler 6 remain the same as when firing No. 6 fuel oil.

D. Application Classification

The application for Madison Paper Industries does not violate any applicable federal or state requirements and does not reduce monitoring, reporting, testing or record keeping. However, this application does include a Best Available Control Technology (BACT) analysis for the added fuel performed per New Source Review.

The modification of a major source is considered a major modification based on whether or not expected emissions increases exceed the "Significant Emission Increase Levels" as given in *Definitions Regulation*, 06-096 Code of Maine Rules (CMR) 100 (as amended).

The emission increases are determined by subtracting the baseline actual emissions of the 24 months preceding the modification (or representative 24 months) from the projected actual emissions. The results of this test are as follows:

<u>Pollutant</u>	Baseline Actual Emissions 2009 – 2010 (ton/year)	Projected Actual Emissions (ton/year)	Net Emissions Increase (ton/year)	Significant Emissions Increase Levels (ton/year)
PM	9.2	11.6	+ 2.4	25
PM ₁₀	9.2	11.6	+ 2.4	15
SO ₂	306.2	0.1	- 306.1	40
NO_X	67.9	46.3	- 21.6	40
CO	7.7	19.1	+ 11.4	100
VOC	0.4	1.3	+ 0.9	40

Departmental Findings of Fact and Order **New Source Review NSR #5**

Notes: Projected actual emissions were based on firing 454 MMscf/year of natural gas. The past actual calculations were based on stack test results for PM and NO_X and AP-42 factors for SO₂, CO and VOC. The future actual calculations were based on AP-42 for SO₂, CO and VOC, manufacturer warranty emission factors for NO_x and 06-096 CMR 115, BACT for PM.

3

Baseline actual emissions were based on emissions from 2009 and 2010 due to the fact that starting in 2011, Madison Paper Industries was licensed to fire natural gas in Boilers 4 and 7, which they predominately ran instead of using No. 6 fuel oil in Boiler 6. Therefore, emissions in 2011, 2012 and 2013 do not reflect the actual usage of Boiler 6.

The above numbers are for Boiler 6 only.

Therefore, this amendment is determined to be a minor modification under *Minor* and Major Source Air Emission License Regulations 06-096 CMR 115 (as amended) since the changes being made are not addressed or prohibited in the Part 70 air emission license. An application to incorporate the requirements of this amendment into the Part 70 air emission license shall be submitted no later than 12 months from commencement of the requested operation.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in Definitions Regulation, 06-096 CMR 100 (as amended). Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in 06-096 CMR 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.\

B. Project Description

In New Source Review license A-427-77-2-A (issued September 1st, 2011), Madison Paper Industries became licensed to fire natural gas in Boilers 4 and 7, in addition to No. 6 fuel oil. As reflected in license A-427-77-2-A, Madison Paper Industries entered into an agreement with Seaside Energy to provide natural gas to the facility either by delivery in liquid form (LNG) to be stored and gasified or by pipeline for use in Boilers 4 and 7.

Departmental Findings of Fact and Order New Source Review NSR #5

Madison Paper Industries proposes to modify Boiler 6 (as was done with Boilers 4 and 7) to allow the boiler to fire natural gas, in addition to the continued use of fuel oil. It is expected that the boiler will be capable of firing either oil or natural gas, but not both fuels simultaneously.

C. Federal Regulations

1. New Source Performance Standards (NSPS)

Madison Paper Industries proposes that the addition of natural gas in Boiler 6 does not constitute a modification of the boiler, as defined by the NSPS regulations.

New units or modifications of existing units are subject to the requirements of 40 CFR Part 60, Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units greater than 100 MMBtu/hr and 40 CFR Part 60, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units between 10-100 MMBtu/hr. The NSPS definition of 'modification' is, in part, any physical or operation change that results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies (§60.14(a)). In addition, §60.14(b) states that the emission rate shall be expressed as kg/hr of any pollutant discharged into the atmosphere for which a standard is applicable and EPA's AP-42 Compilation of Air Emission Factors may be used to demonstrate that the emission level resulting from the physical or operational change will either clearly increase or clearly not increase.

The standards addressed in 40 CFR Part 60, Subpart Db are for PM and SO₂, and the standards in 40 CFR Part 60, Subpart Dc are for PM, SO₂ and NO_X. As seen in the tables below, all three pollutants, both on an AP-42 factor lb/MMBtu basis and a calculated mass emission (lb/hr), are lower for natural gas than for oil.

AP-42 Factors in lb/MMBtu

	PM		S	$\overline{\mathbf{O_2}}$	NO _X	
	Oil	NG	Oil	NG	Oil	NG
Boiler 6	0.144	0.0075	2.09	0.0006	0.367	0.049

Note: The oil sulfur content of 2% for Boiler 6 was used in the PM and SO₂ oil calculations.

Departmental Findings of Fact and Order New Source Review NSR #5

Calculation of lb/hr from AP-42 Factors and Boiler Capacities

5

	PM		SC	SO_2		NO _X	
	Oil	NG	Oil	NG	Oil	NG	
Boiler 6	14.34	0.74	208.5	0.059	36.52	4.88	

Note: The current oil license limits are slightly different from the AP-42 values.

The Department has determined that adding natural gas firing capability to Boiler 6 is not considered a modification for NSPS purposes based on the following: the addition of natural gas as an alternative fuel will not cause emissions increases of any pollutant regulated by 40 CFR Part 60, Subparts Db or Dc; the project does not result in an increase in the facility's steam demand; and the natural gas (when fired) will replace oil, decreasing actual PM, SO₂, and NO_X emissions.

2. National Emission Standards for Hazardous Air Pollutants (NESHAPs)

The allowance to fire natural gas in Boiler 6 does not change the status of the boiler as an existing source for the purposes of the current applicable regulations under 40 CFR Part 63. The additional fuel is not considered a change which would make the unit either new or a reconstructed source.

3. Compliance Assurance Monitoring (CAM)

When firing natural gas, Boiler 6 does not meet the applicability criteria in the CAM rule under 40 CFR Part 64.

D. Boiler 6

Boiler 6 was manufactured in 1980 by Nebraska Boiler Co. and rated at 99.6 MMBtu/hour firing No. 6 fuel oil with a sulfur content of 2.0%, by weight. The unit has a Coen low NO_X oil burner and exhausts through the common boiler stack (Stack #1).

Madison Paper Industries has requested to be licensed to fire natural gas in Boiler 6 in addition to firing fuel oil. The facility has proposed to have the heat input rate when firing natural gas to be equivalent to the No. 6 fuel oil combustion rate of 99.6 MMBtu/hr. The expected burner configuration will be such that the boiler will fire either fuel oil or natural gas.

The proposed changes to Boiler 6 include installing a separate natural gas fuel train, burner modification and controls (gas injectors, a manifold, and additional burner parts), the ability to manually close the NO_X ports, minor changes to the

Departmental Findings of Fact and Order New Source Review NSR #5

existing PLC-based electronic burner management system, and the replacement of the existing flame scanner. The gas burner tips will be located around the periphery of the burner to uniformly distribute the gas to the entire burner cross section. A breach damper will also be added to provide constant furnace pressure to the boiler.

The modification of Boiler 6 is the addition of natural gas, which is inherently low emission fuel. The use of combustion controls represents BACT for this type and size of boiler when firing natural gas.

1. BACT Findings

The BACT emission limits for Boiler 6 when firing natural gas were based on the following:

Natural Gas

PM/PM₁₀ - 0.05 lb/MMBtu based 06-096 CMR 115, BACT
SO₂ - 0.6 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
NO_X - 0.20 lb/MMBtu based on the manufacturer's warranty
CO - 84 lb/MMscf based on AP-42, Table 1.4-1, dated 7/98
VOC - 5.5 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
Opacity - 06-096 CMR 101

The BACT emission limits for Boiler 6 when firing natural gas are the following:

	PM	PM ₁₀	SO_2	NO_{x}	CO	VOC
<u>Unit</u>	<u>(lb/hr)</u>	(lb/hr)	(lb/hr)	<u>(lb/hr)</u>	<u>(lb/hr)</u>	<u>(lb/hr)</u>
Boiler 6	4.98	4.98	0.06	19.92	8.20	0.54

Visible emissions from Boiler 6 when firing natural gas shall not exceed 10% opacity on a 6-minute block average, except for no more than one (1) six (6) minute block average in a 3-hour period.

2. Periodic Monitoring

Periodic monitoring for the boiler shall include recordkeeping to document natural gas fuel use both on a monthly and 12-month rolling total basis.

E. Boilers 4 and 7 Emission Factors

In the New Source Review amendment license, A-427-77-2-A (issued September 1, 2011), Boilers 4 and 7 were licensed to fire natural gas with the emission

Departmental
Findings of Fact and Order
New Source Review
NSR #5

factors for PM and PM₁₀ being based on AP-42. The PM and PM₁₀ emission factors are being updated to reflect a more updated BACT determination by the Department. All other emission factors will remain as were licensed in A-427-77-2-A (issued September 1, 2011) and A-427-77-4-A (issued January 24, 2012).

7

1. BACT/BPT Findings

The BACT emission limits for PM and PM_{10} in Boilers 4 and 7 when firing natural gas are based on the following:

PM/PM₁₀ – 0.05 lb/MMBtu based 06-096 CMR 115, BACT

The BACT/BPT emission limits for Boilers 4 and 7 when firing natural gas are the following:

	PM	PM ₁₀	SO_2	NO_{x}	CO	VOC
<u>Unit</u>	(lb/hr)	<u>(lb/hr)</u>	<u>(lb/hr)</u>	<u>(lb/hr)</u>	<u>(1b/hr)</u>	<u>(lb/hr)</u>
Boiler 4	6.24	6.24	0.07	24.96	10.28	0.67
Boiler 7	6.14	6.14	0.07	24.54	10.10	0.66

F. Minor Modification Compliance

This project was classified as a minor modification based on the comparison of baseline actual emissions firing fuel oil to future actual emissions firing natural gas for Boiler 6 alone. The future actual emissions were calculated using Boiler 6 at 454 MMscf/year.

In the New Source Review amendment license, A-427-77-2-A (issued September 1, 2011), Boilers 4 and 7 were licensed to fire natural gas in addition to No. 6 fuel oil. Projected actual emissions were calculated using Boiler 4 at 689,300 MMBtu/year and Boiler 7 at 666,500 MMBtu/year. However, even with Boilers 4 and 7 operating at a worst case (1,093,248 MMBtu/year and 1,074,851 MMBtu/year for each boiler, respectively), a natural gas fuel cap was not needed to keep the addition of natural gas in those two boilers below the major modification thresholds.

In order to determine if Madison Paper Industries is required to have an annual natural gas limit to remain a minor modification, all three boilers (Boilers 4, 6 and 7) were taken into account since they can be used interchangeably. Calculations were performed with Boilers 4, 6 and 7 firing only gas and operating at worst case (8,760 hours/year, or 1,093,248 MMBtu/year, 872,496 MMBtu/year and 1,074,851 MMBtu/year for each boiler, respectively). The calculation results showed that under worst case future emissions the minor modification threshold for NO_X and CO is exceeded.

	Totals for Boilers 4, 6 and 7							
	Average Past Actual Emissions 2009 – 2010	Projected Future Actual Emissions at a Worse Case Natural Gas Usage Scenario	Net Emissions Increase	Significant Emissions Increase Levels				
<u>Pollutant</u>	(ton/year)	(ton/year)	(ton/year)	(ton/year)				
PM	78.4	76.01	- 2.39	25				
PM ₁₀	78.4	76.01	- 2.39	15				
SO_2	726.85	0.89	- 725.96	40				
NO _X	196.7	304.06	+ 107.36	40				
CO	20.3	125.20	+ 104.9	100				
VOC	1.2	8.20	+ 7.0	40				

8

Therefore, in order to ensure compliance with the minor modification status and for ease at recordkeeping, Madison Paper Industries has agreed to an annual licensed fuel cap of 1,650,000 MMBtu/year of either natural gas, No. 6 fuel oil, or any combination of the two fuels. When firing natural gas for the entirety of the 1,650,000 MMBtu/year licensed fuel cap, the net emission increase of NO_X and CO each remain under their respective tons per year significant emission increase level as seen in the table below.

	Totals for Boilers 4, 6 and 7						
	Average Past Actual Emissions 2009 – 2010	Projected Future Actual Emissions at 1,650,000 MMBtu/yr Scenario Firing Natural Gas	Net Emissions Increase	Significant Emissions Increase Levels			
Pollutant	(ton/year)	<u>(ton/year)</u>	(ton/year)	(ton/year)			
NO_X	196.7	165.00	- 31.70	40			
СО	20.3	67.94	+ 47.64	100			

This value of 1,650,000 MMBtu/year equates to the licensed 11,000,000 gallons/year fuel limit of No. 6 fuel oil.

G. Incorporation into the Part 70 Air Emission License

The requirements in this 06-096 CMR 115 New Source Review amendment shall apply to the facility upon amendment issuance. Per *Part 70 Air Emission License Regulations*, 06-096 CMR 140 (as amended), Section 1(C)(8), for a modification that has undergone NSR requirements or been processed through 06-096 CMR 115, the source must then apply for an amendment to the Part 70 license within one year of commencing the proposed operations as provided in 40 CFR Part 70.5.

Departmental Findings of Fact and Order New Source Review NSR #5

H. Annual Emissions

This amendment does not change the current licensed allowable emission limits. The facility licensed emissions were calculated based on the worst-case scenario of an annual No. 6 fuel oil limit of 1,650,000 MMBtu/year (based on a 12-month rolling total), an annual SO₂ limit of 1,276 tons per year for the boilers, use of the groundwood mill, and 1,008 hours of operation of a temporary package boiler.

9

Total Licensed Annual Emissions for the Facility Tons/year

(used to calculate the annual license fee)

EMISSION UNIT	PM	PM ₁₀	SO ₂	NO _X	CO	VOC
Boilers 4, 6 and 7	135	135	1276	371	100	8
Groundwood Process	_	_	-	_	_	39
Temporary Package Boiler	2	2	23	5	4	0.2
Total TPY	137	137	1299	376	104	47

Notes: The addition of the temporary package boiler emissions is worst-case scenario since the emissions will actually be offset by one or more of the three main boilers being off-line.

Emissions for Boilers 4, 6 and 7 while firing natural gas at the maximum fuel cap were all lower than licensed allowed emissions while firing No. 6 fuel oil at the same maximum fuel cap.

The worst-case scenario for each pollutant was based on the 1,650,000 MMBtu/year fuel cap while firing No. 6 fuel oil (equivalent to 11,000,000 gal/year oil) and the largest emission limit, calculated as follow:

PM - Boiler 4 at its max. oil usage, with the remainder fired in Boiler 6

PM₁₀ - Boiler 4 at its max. oil usage, with the remainder fired in Boiler 6

SO₂ - The licensed tons per year limit

NO_X - Boilers 4 and 6 using the full fuel limit

CO - Boiler 7 at its max. oil usage, with the remainder fired in Boiler 4 or 6

VOC - Any combination of Boilers 4, 6 and 7 using the full fuel limit.

Departmental
Findings of Fact and Order
New Source Review
NSR #5

III. AMBIENT AIR QUALITY ANALYSIS

According to 06-096 CMR 115, the level of air quality analyses required for a minor modification shall be determined on a case-by case basis. Maine Ambient Air Quality Standards (MAAQS) will not be violated by this source based on the information available in the file, the firing of natural gas which will offset fuel oil, the tons per year emissions which are not changing and the reduced short term emission limits of PM, SO₂ and NO_X.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-427-77-5-A pursuant to the preconstruction licensing requirements of 06-096 CMR 115 and subject to the standard and special conditions below.

<u>Severability</u>. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

SPECIFIC CONDITIONS

The following shall replace Condition (1) in air emission license amendment A-427-77-4-A:

(1) Boiler 4

A. Fuel

- 1. Natural gas may be fired in Boiler 4. [06-096 CMR 115, BACT]
- 2. Boilers 4, 6 and 7 shall not exceed a combined 1,650,000 MMBtu/year of No.6 fuel oil and natural gas, based on a 12-month rolling total basis. [06-096 CMR 115, BACT]

10

- 11
- 3. Compliance shall be demonstrated by fuel records from the supplier showing the quantity and type of the fuel delivered. Records of annual natural gas fuel use shall be kept on a monthly and 12-month rolling total basis. [06-096 CMR 115, BACT]
- B. Emissions from Boiler 4 (124.8 MMBtu/hr on natural gas) shall not exceed the following limits while firing natural gas [06-096 CMR 115, BACT]:

Pollutant	lb/MMBtu	Limit
PM	0.05 (based on 06-096 CMR 115, BACT)	6.24 lb/hr
PM_{10}	-	6.24 lb/hr
SO_2	-	0.07 lb/hr
NO _X	0.2 (determined by stack testing)	24.96 lb/hr
CO	-	10.28 lb/hr
VOC	-	0.67 lb/hr

C. Visible emissions from Boiler 4 when firing natural gas shall not exceed 10% opacity on a six (6) minute block average basis, except for no more than one (1) six (6) minute block average in a 3-hour period. [06-096 CMR 101]

The following shall replace Condition (2) in air emission license amendment A-427-77-4-A:

(2) **Boiler** 7

A. Fuel

- 1. Natural gas may be fired in Boiler 7. [06-096 CMR 115, BACT]
- 2. Boilers 4, 6 and 7 shall not exceed a combined 1,650,000 MMBtu/year of No.6 fuel oil and natural gas, based on a 12-month rolling total basis. [06-096 CMR 115, BACT]
- 3. Compliance shall be demonstrated by fuel records from the supplier showing the quantity and type of the fuel delivered. Records of annual natural gas fuel use shall be kept on a monthly and 12-month rolling total basis. [06-096 CMR 115, BACT]
- B. Emissions from Boiler 7 (122.7 MMBtu/hr on natural gas) shall not exceed the following limits while firing natural gas [06-096 CMR 115, BACT]:

2

Pollutant	lb/MMBtu	Limit
PM	0.05	6.14 lb/hr
	(based on 06-096 CMR 115, BACT)	
PM_{10}	-	6.14 lb/hr
SO_2	-	0.07 lb/hr
	0.2	
NO_X	(determined by CEM data, 30-day	24.54 lb/hr
	rolling total)	
СО	-	10.10 lb/hr
VOC	-	0.66 lb/hr

C. Visible emissions from Boiler 7 when firing natural gas shall not exceed 10% opacity on a six (6) minute block average basis, except for no more than one (1) six (6) minute block average in a 3-hour period. [06-096 CMR 101]

The following are new Conditions:

(3) Boiler 6

A. Fuel

- 1. Natural gas may be fired in Boiler 6. [06-096 CMR 115, BACT]
- 2. Boilers 4, 6 and 7 shall not exceed a combined 1,650,000 MMBtu/year of No.6 fuel oil and natural gas, based on a 12-month rolling total basis. [06-096 CMR 115, BACT]
- 3. Compliance shall be demonstrated by fuel records from the supplier showing the quantity and type of the fuel delivered. Records of annual natural gas fuel use shall be kept on a monthly and 12-month rolling total basis. [06-096 CMR 115, BACT]
- B. Emissions from Boiler 6 (99.6 MMBtu/hr on natural gas) shall not exceed the following limits while firing natural gas [06-096 CMR 115, BACT]:

Pollutant	lb/MMBtu	Limit
PM	0.05 (based on 06-096 CMR 115, BACT)	4.98 lb/hr
PM ₁₀	-	4.98 lb/hr
SO_2	-	0.06 lb/hr
NO _X	0.2 (based on manufactures data)	19.92 lb/hr
CO	-	8.20 lb/hr
VOC	-	0.54 lb/hr

Departmental
Findings of Fact and Order
New Source Review
NSR #5

13

- C. Visible emissions from Boiler 6 when firing natural gas shall not exceed 10% opacity on a six (6) minute block average basis, except for no more than one (1) six (6) minute block average in a 3-hour period. [06-096 CMR 101]
- (4) Madison Paper Industries shall submit an application to incorporate this amendment into the Part 70 air emission license no later than 12 months from commencement of the requested operation. [06-096 CMR 140, Section 1(C)(8)]

DONE AND DATED IN AUGUSTA, MAINE THIS

DAY OF April

, 2014.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

SY: More Illen

ATRICIA W. AHO, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 02/28/2014

Date of application acceptance: 03/03/2014

Date filed with the Board of Environmental Protection:

This Order prepared by Allison M. Hazard, Bureau of Air Quality.

Filed

State of Maine Board of Environmental Protection